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| APPLICATION NO.   | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 09/980,429  | 11/30/2001  | Toshinori Iinuma     | NAK1-BQ55           | 3413             |
| 21611   | 7590        | 01/12/2006           | EXAMINER            |                  |
| SNELL & WILMER LLP<br>600 ANTON BOULEVARD<br>SUITE 1400<br>COSTA MESA, CA 92626 |             |                      | ROBERTS, BRIAN S    |                  |
|   |             |                      | ART UNIT            | PAPER NUMBER     |
|   |             |                      | 2662                |                  |

DATE MAILED: 01/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/980,429

Applicant(s)

IINUMA, TOSHINORI

Examiner

Brian Roberts

Art Unit

2662

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 25 October 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 6-17 is/are rejected.
- 7) ☒ Claim(s) 1-5 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 November 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

- Applicant's Amendment filed 10/25/2005 is acknowledged.
- Claims 1, 3, and 5 have been amended.
- Claims 6-17 have been added.
- Claims 1-17 remain pending.

### ***Claim Objections***

1. Claims 1-5 is objected to because of the following informalities:
  - In claim 1 line 5-6, "how time slots are assigned mobiles stations" should read --how time slots are assigned to the mobile stations--
  - In claim 1 line 10, "a judging means for judging whether a reception level" should read -- a judging means for judging whether the reception level—
  - In claim 1 line 13, "threshold value; occupy" should read --threshold value, occupy--
  - In claim 2 line 2, "wherein if it is judged that the reception level" should read -- wherein if the judging means judges that the reception level--
  - Claims 3-5 are objected to because they depend from claim 1.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 9, 14, 16-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

- In reference to claim 9

The phrase "the control unit changes frequency" renders the claim indefinite. It is unclear what is the frequency and how the frequency is associated with the control unit.

- In reference to claim 14

The term "in order" in claim 10 renders the claim indefinite. It is unclear which order the signal levels are placed.

- In reference to claim 16

The claim should clearly state that the base station comprises a plurality of radios that each transmit on a different frequency.

- In reference to claim 17

In line 3 of claim 17, the term "power" renders the claim indefinite. The term "power" should read --transmission power--.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 6-10 and 12-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shad et al. (Indoor SDMA Capacity Using A Smart Antenna Basestation).

- In reference to claim 6-7 and 9, as best understood

Shad et al. (Indoor SDMA Capacity Using A Smart Antenna Basestation) teaches a base station capable of communicating with the plurality of portable stations that includes logical units to:

- o Receive the signal and measure the signal level to calculate the SINR<sub>i</sub> (signal level) (pg 869 column 2 section A)
- o Compare the SINR<sub>i</sub> to the SINR<sub>min</sub> (pg 869 column 2 section A)
- o Assign each portable station a TDMA time slot according to a SDMA/TDMA slot allocation algorithm based on the condition  $SINR_i \geq SINR_{min}$  (pg 869 column 2 section A)
- o Provide the stations with power control feedback so that the power received from each station is identical (pg 871 column 1 section C)

Shad et al. does not explicitly teach a storage unit that stores the signal level for each of the plurality of signals or a control unit that reduces or increase the transmission power of the second time slot according to the signal level as compared to the threshold value.

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Shad et al. suggest including a storage unit to store the signal level in order to order the station signatures in order of ascending power and suggest providing the stations with power control feedback so that the power received from each station is identical (pg 871 column 1 section C)

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the base station of Shad et al. to include a storage unit and a control unit as suggested by Shad et al. because the storage unit would allow the signal levels of each of the plurality of stations to be stored so that they could be sorted in ascending power to help prevent those with higher power from overpowering the others and the control unit would allow the mobile units assigned to a time slot with a transmission power above a threshold to lower their transmission and power and mobile units assigned to a time slot with a transmission power below a threshold to increase their transmission power so that the power received from each station is identical.

- In reference to claim 8

Shad et al. (Indoor SDMA Capacity Using A Smart Antenna Basestation) teaches a system and method that covers substantially all limitations of the parent claim. Shad et al. further teaches that base station includes:

- A smart antenna operating multiple beam formers using SDMA/TDMA that receive a plurality of signals (pg 868, column 2, paragraph 1)

Inherently includes radio to demodulate the plurality of signals and a measuring unit to calculate the SINR<sub>i</sub> (pg 869 column 2 section A)

- In reference to claim 10

Shad et al. (Indoor SDMA Capacity Using A Smart Antenna Basestation) teaches a system and method that includes:

- A plurality of portable stations capable of TDMA (abstract)
- A base station capable of communicating with the plurality of portable stations that includes logical units to:
  - Receive the signal and measure the signal level to calculate the  $SINR_i$  (pg 869 column 2 section A)
  - Assign each portable station a TDMA time slot according to a SDMA/TDMA slot allocation algorithm based on the condition  $SINR_i \geq SINR_{min}$  (pg 869 column 2 section A)

Shad et al. does not explicitly teach a control unit that adjust power for the TDMA time slot based on the signal level of the mobile station assigned to the time slot.

Shad et al. suggest providing the stations with power control feedback so that the power received from each station is identical (pg 871 column 1 section C)

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the base station of Shad et al. to include a control unit a control unit that adjust power for the TDMA time slot based on the signal level of the mobile station assigned to the time slot as suggested by Shad et al. because the control unit would allow the mobile stations assigned to a time slot with a transmission power above a threshold to lower their transmission and power and mobile units assigned to a time slot

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with a transmission power below a threshold to increase their transmission power so that the power received from each station is identical.

- In reference to claim 12

Shad et al. (Indoor SDMA Capacity Using A Smart Antenna Basestation) further teaches that base station includes:

- A smart antenna operating multiple beam formers using SDMA/TDMA that receive a plurality of signals (pg 868, column 2, paragraph 1)
- Inherently includes radio to demodulate the plurality of signals and a measuring unit to calculate the SINR<sub>i</sub> (pg 869 column 2 section A)

- In reference to claim 13

Shad et al. (Indoor SDMA Capacity Using A Smart Antenna Basestation) further teaches that base station assigns each portable station a TDMA time slot according to a SDMA/TDMA slot allocation algorithm based on the condition  $SINR_i \geq SINR_{min}$ . (page 869 column 2 section A)

- In reference to claim 14, as best understood

Shad et al. (Indoor SDMA Capacity Using A Smart Antenna Basestation) further teaches that base station sorting the station signatures in order of ascending power to help prevent those with higher power from overpowering the others. (page 870 column 1 paragraph 5)



- In reference to claim 15

Shad et al. (Indoor SDMA Capacity Using A Smart Antenna Basestation) teaches a system and method that includes:

- A plurality of portable stations capable of TDMA (abstract)
- A base station capable of communicating with the plurality of portable stations that includes logical units to:
  - A smart antenna operating multiple beam formers using SDMA/TDMA that transmit and receive a plurality of signals (pg 868, column 2, paragraph 1)
  - Receive the signal and measure the signal level to calculate the  $SINR_i$  (pg 869 column 2 section A)
  - Assign each portable station a TDMA time slot according to a SDMA/TDMA slot allocation algorithm based on the condition  $SINR_i \geq SINR_{min}$  (pg 869 column 2 section A)

Shad et al. does not explicitly teach a control unit that adjust power based on the signal level of the mobile radio assigned to the time slot.

Shad et al. suggest providing the stations with power control feedback so that the power received from each station is identical (pg 871 column 1 section C)

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the base station of Shad et al. to include a control unit that adjust power based on the signal level of the mobile radio assigned to the time slot as suggested by Shad et al. because the control unit would allow the mobile stations

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assigned to a time slot with a transmission power above a threshold to lower their transmission and power and mobile units assigned to a time slot with a transmission power below a threshold to increase their transmission power so that the power received from each station is identical.

6. Claims 11 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shad et al. (Indoor SDMA Capacity Using A Smart Antenna Basestation) in view of Roy III et al. (US 515378)

- In reference to claim 11 and 16, as best understood

Shad et al. (Indoor SDMA Capacity Using A Smart Antenna Basestation) teaches a system and method that covers substantially all limitations of the parent claim.

Shad et al. (Indoor SDMA Capacity Using A Smart Antenna Basestation) does not teach that the base station includes a plurality of radios that transmit on a plurality of frequencies and that the base station assigns each mobile station to one of the plurality of radios.

In Figure 9, Roy III et al. teaches a base station with a plurality of radios (152, 154, 156) that transmit on plurality of frequency channels (C<sub>n</sub>) wherein the base station assigns each mobile station (20, 22, 24) to one of the plurality of radios. (column 14 lines 55-66)

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system and method of Shad et al. to include the base station including a plurality of radios that transmit on a plurality of frequencies and that the base

station assigns each mobile station to one of the plurality of radios as taught by Roy III et al. because combining the spatial/time multiplexing with having a plurality of frequencies would provide more channels and thus increase the number of mobile stations that the base station could serve.

***Allowable Subject Matter***

7. Claim 1-5 would be allowable if rewritten or amended to overcome the objections, set forth in this Office action.

- In reference to claim 1

Independent claims 1 would be allowed because the prior record fails to teach or fairly suggest a radio base station time division/space multiplexing system with a control means for reducing a transmission power during a time slot, which is occupied by the mobile stations that each have a reception level no less than the threshold value, to a level that is lower than the transmission power of other time slots.

- In reference to claim 2-5

In reference to claims 2-5 would be allowed because they are dependent from claim 1.

8. Claim 17 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

- In reference to claim 17

The prior record fails to teach or fairly suggest a radio base station with a access control unit that assigns more than one mobile radio to a single time slot and wherein the transmission power control unit adjusts power based on the lowest signal level assigned to the single time slot.

### ***Conclusion***

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure are:

- Thibault et al. (US 6240098) teaches a method and device for space division multiplexing of radio signals transmitted in cellular radio communications.

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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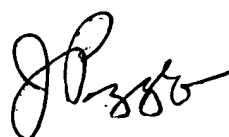
the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian Roberts whose telephone number is (571) 272-3095. The examiner can normally be reached on M-F 8:30-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hassan Kizou can be reached on (571) 272-3088. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

BSR  
12/30/2005

  
**JOHN PEZZLO**  
**PRIMARY EXAMINER**